



February 13, 2012

William K. Honker
Director, Water Quality Protection Division
United States Environmental Protection Agency
Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Application to Exempt a Portion of the Goliad Formation in Goliad County

Dear Mr. Honker:

As you are aware, the Texas Commission on Environmental Quality (TCEQ) submitted a request for concurrence on its approval of an aquifer exemption (AE) for UEC's Goliad project on May 27, 2011. Region 6 responded to TCEQ on July 1, 2011 by noting that the application was "incomplete" and requesting unprecedented modeling to demonstrate that the proposed AE does not currently serve as a source of drinking water. In an effort to understand better and address the content of the Region's concerns, UEC met with Region 6 staff in Dallas on December 2, 2011, and again on January 18, 2012.

In the December meeting, the Region asked UEC to develop an approach for modeling the capture zones of certain wells outside the AE boundary. While the modeling requested by the Region is clearly not required by EPA regulations or guidance, UEC is willing to work in good faith to conduct modeling if the request is reasonable and the Region is specific about the information it needs to process the AE request in a timely manner. Unfortunately, as described below, the Region continues to change the standards it is using to evaluate this project, leading to continuing and unnecessary delay.

Scope of Modeling

In the December and January meetings, Region 6 expressed concern regarding the numerous drinking water wells proximate to the aquifer exemption boundary.

The Mine Permit Application clearly shows that there are no domestic water wells within the AE boundary and only seven wells within one-quarter mile of the boundary. This fact was verified by TCEQ and addressed during the contested case hearing. The mechanism for determining whether a proposed AE is currently serving as a source of drinking water is clearly established by existing regulations and guidance. EPA Guidance 34 provides that:

"... the applicant should survey the proposed exempted area to identify any water supply wells which tap the proposed exempted aquifer. [Emphasis added]. The

area to be surveyed should cover the exempted zone and a buffer zone outside the exempted area. The buffer zone should extend a minimum of a 1/4 mile from the boundary of the exempted area. Any water supply wells located should be identified on the map showing the proposed exempted area. If no water supply wells would be affected by the exemption, the request should state that a survey was conducted and no water supply wells are located which tap the aquifer to be exempted within the proposed area." [Emphasis added].

For your reference, attached is a map showing only seven domestic water wells are within one-quarter mile of the proposed AE boundary.

The map does not include wells 24 and 25 – the only wells close to the AE boundary with known completion intervals and wells the Region previously acknowledged were of high interest. As the region should be aware, wells 24 and 25 no longer exist.

Because of naturally elevated radium-226 (29 pCi/l) in one of the wells and elevated levels of chloride, magnesium, and nitrate in the other well, the owner of the wells decided to have the wells plugged and replaced with a new well. The new well was built by UEC approximately 1,100 feet south of the old location. The property owner is pleased with the new water well, which was completed in the shallowest fresh water zone; namely, Sand A.

Without going into technical details (all of which were reviewed by TCEQ and considered during the contested case hearing), well distance, groundwater flow direction, and rate of movement, as well as other hydrological factors, make it impossible for the remainder of the wells shown on the attached map to "currently" draw water from the proposed AE area.

Although supporting this fact with modeling is unprecedented, UEC informed Region 6 during the December meeting that it would be willing to go beyond what the rules require and prepare a reasonable modeling approach. After the December meeting, it seemed that UEC and Region 6 had resolved what it would take to move forward with the processing of the AE application. Briefly, the proposed model would demonstrate that no existing drinking water well would be affected by UEC's project. The model would show that existing drinking water wells are not currently drawing water from the proposed AE area. The model would also show that existing drinking water wells cannot draw water from the AE area during the entire 8 year project life, which includes groundwater restoration. A copy of the modeling plan UEC proposed is also attached for your review.

Unfortunately, during the January meeting, the Region did not provide any feedback on UEC's proposed modeling plan. Instead, as described below, the Region changed the parameters that were previously agreed to and asked UEC to present another plan.

Timeframe of Modeling

During UEC's December meeting with Region 6 staff, UEC was told that the evaluation time period for the model should cover the mine life – a time period consistent with existing regulations (40 CFR § 144.6). This was not the first time the Region suggested this timeframe

for the model. In the Region's July 1, 2011 letter to TCEQ, the Region states, "The time period for such an analysis should extend across all projected production and restoration phases of the proposed mine activity."

As a result of its December meeting with the Region, UEC developed a modeling plan that would cover the mine life. Despite acknowledging that UEC's approach was reasonable, the Region, during the January meeting, provided UEC a new definition of "currently" that covers an indefinite period. According to the new definition Region 6 provided, the Region "recognizes any aquifer, or portion thereof, containing water that is destined to be captured by an existing water well for human consumption as currently serving as a source of drinking water for that well." The Region told UEC that the timeframe of the model should be based on the average lifespan of wellbores in the area, something that is impossible to quantify and could easily exceed 50 years.

In addition to failing to give serious consideration to the attached modeling plan, in the January meeting, Region 6 staff suggested a process of developing a protracted fate and transport model of conditions "inside" the AE and another model addressing capture conditions "outside" the AE, an expensive and prolonged exercise that is highly inappropriate under the Safe Drinking Water Act and existing rules and regulations.

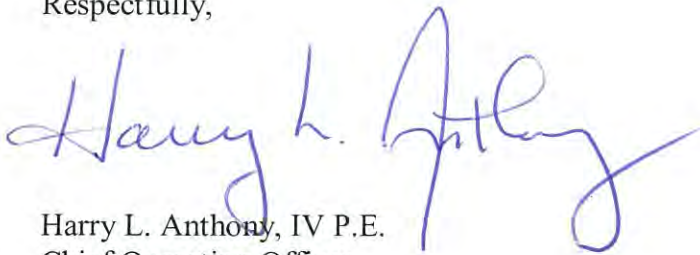
Next Steps

It appears that Region 6 is departing from existing rules and long-standing precedent for processing AE applications. Although UEC offered to go above and beyond and conduct unprecedented modeling, UEC's proposed modeling approach was summarily dismissed by the Region without any discussion.

UEC wishes to reiterate our willingness to follow through with the modeling approach that was proposed during our January meeting with Region 6 staff.

Your attention to this matter is sincerely appreciated, and we eagerly await your response.

Respectfully,

A handwritten signature in blue ink, reading "Harry L. Anthony, IV". The signature is fluid and cursive, with a large, stylized "H" and "A".

Harry L. Anthony, IV P.E.
Chief Operating Officer

Attachments: (1) Map of wells within one-quarter mile of the proposed AE boundary
(2) UEC's proposed modeling plan

cc: Bob Perciasepe, Deputy Administrator, Environmental Protection Agency
David Gillespie, Regional Counsel, Region 6
Stacey Dwyer, Associate Director, Source Water Protection Branch, Region 6
Mark Vickery, Executive Director, Texas Commission on Environmental Quality
Brent Wade, Director, Remediation Division, TCEQ
Susan Jablonski, Radioactive Materials Division, TCEQ

UEC Aquifer Exemption Boundary

**EPA Region 6
Dallas
1/18/12**





Aquifer Exemption Boundary

- **Objective:**

- Demonstrate that no existing domestic well that is currently used for human consumption is using water from the AE Area
- Demonstrate that no existing domestic well could produce water from the AE Area for the entire mine life

- **Approach:** Use accepted EPA capture zone methods and site data to delineate capture zones



Capture Zone Time Frame

- We will perform calculations of capture for the 8 year mine life provided in the issued permit.
- This is consistent with:
 - 40 CFR 146.6
 - Region 6 EPA's response to UEC's Application received on May 27, 2011



Capture Zone Approach

1. Tabulate the rural domestic wells to be considered in the AOR and detail what strata each is completed in, where known.
2. Calculate average hydraulic gradients in each stratum
3. Calculate the 8 year capture zones for each rural domestic well and plot relative to the AE Boundary

8 year Capture Zone

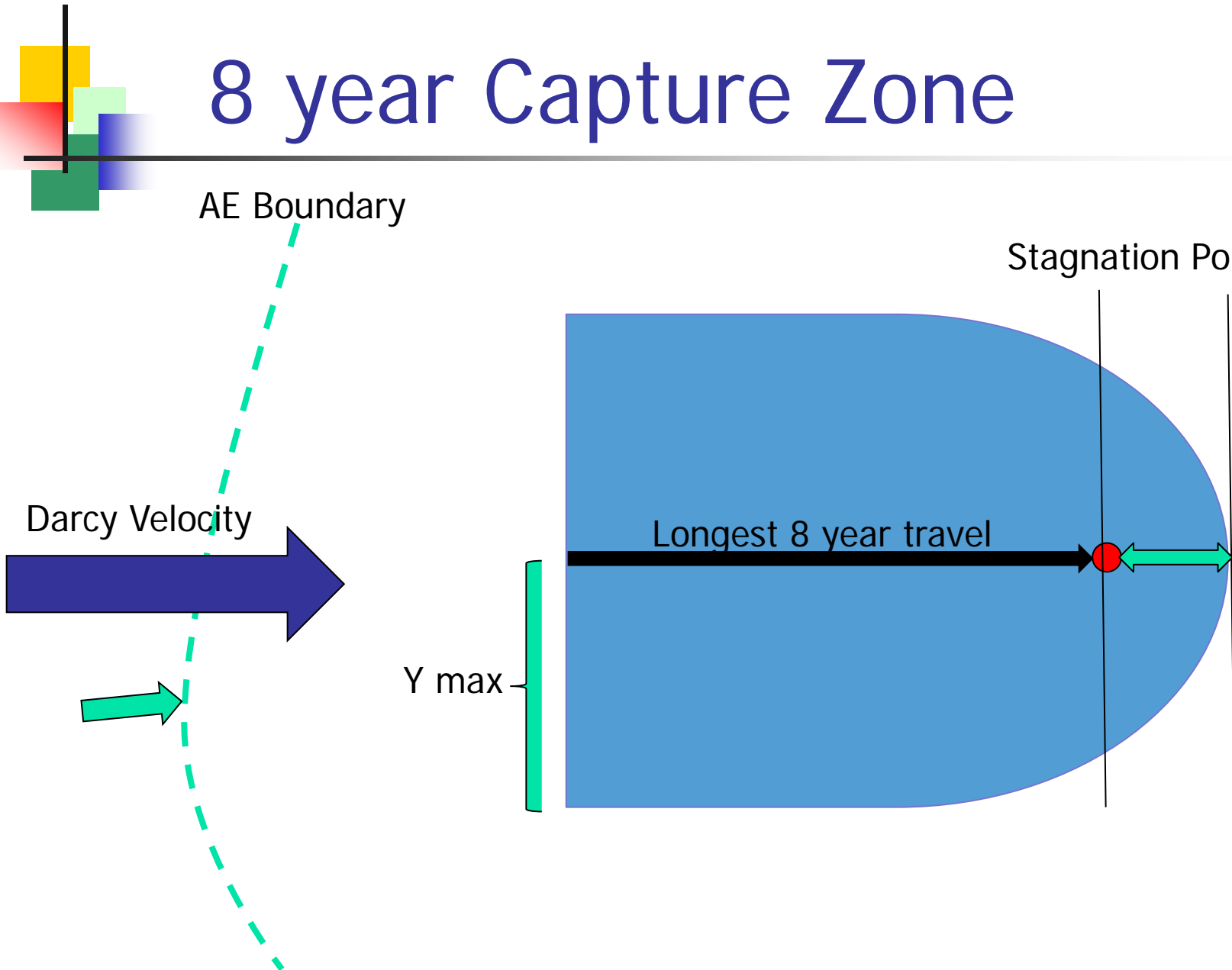
AE Boundary

Stagnation Point X_o

Darcy Velocity

Longest 8 year travel

Y max





Variables / Nomenclature

Q	=	Extraction rate at rural/domestic well (L^3/T)
K	=	Average hydraulic conductivity of stratum (L/T)
b	=	Average thickness of stratum (L)
T	=	Average transmissivity ($K * b$) of stratum (L^2/T)
i	=	Average hydraulic gradient (L/L)
Φ	=	Porosity of stratum (L^3/L^3)
v	=	Average seepage velocity (L/T)
x	=	Coordinate parallel to seepage velocity direction
y	=	Coordinate normal to seepage velocity direction



Capture Model Properties

Stratum	Average Thickness (ft)	Average Hydraulic Gradient	
		Magnitude (ft/ft)	Direction (degrees)
A	65	TBD	TBD
B	36	TBD	TBD
C	36	TBD	TBD
D	80	TBD	TBD

- We have good sand hydraulic properties from two large-scale pump tests and a calibrated flow model of the B-sand



Rural/Domestic Use

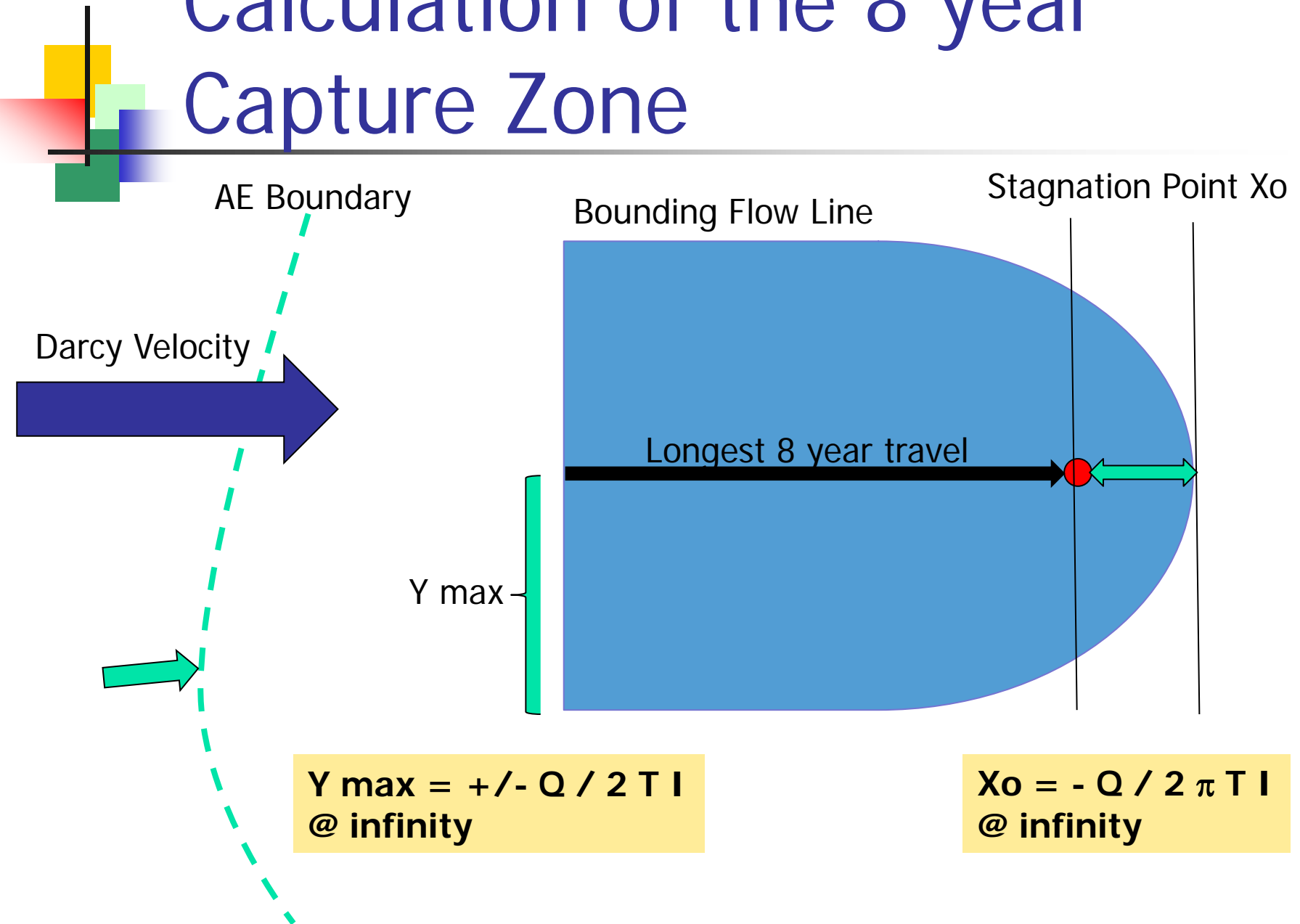
- 2009 Water use survey data (Kevin Kluge, TWDB)
- Based upon municipal use and population – TWDB does not calculate a county gpd/capita for rural/domestic
- Goliad County = 119 gpd/person
 - State average = 150 gpd/person
- Average household in Goliad County is comprised of 2.6 people
 - <http://www.goliadcc.org/index.php/re-location-info.html>



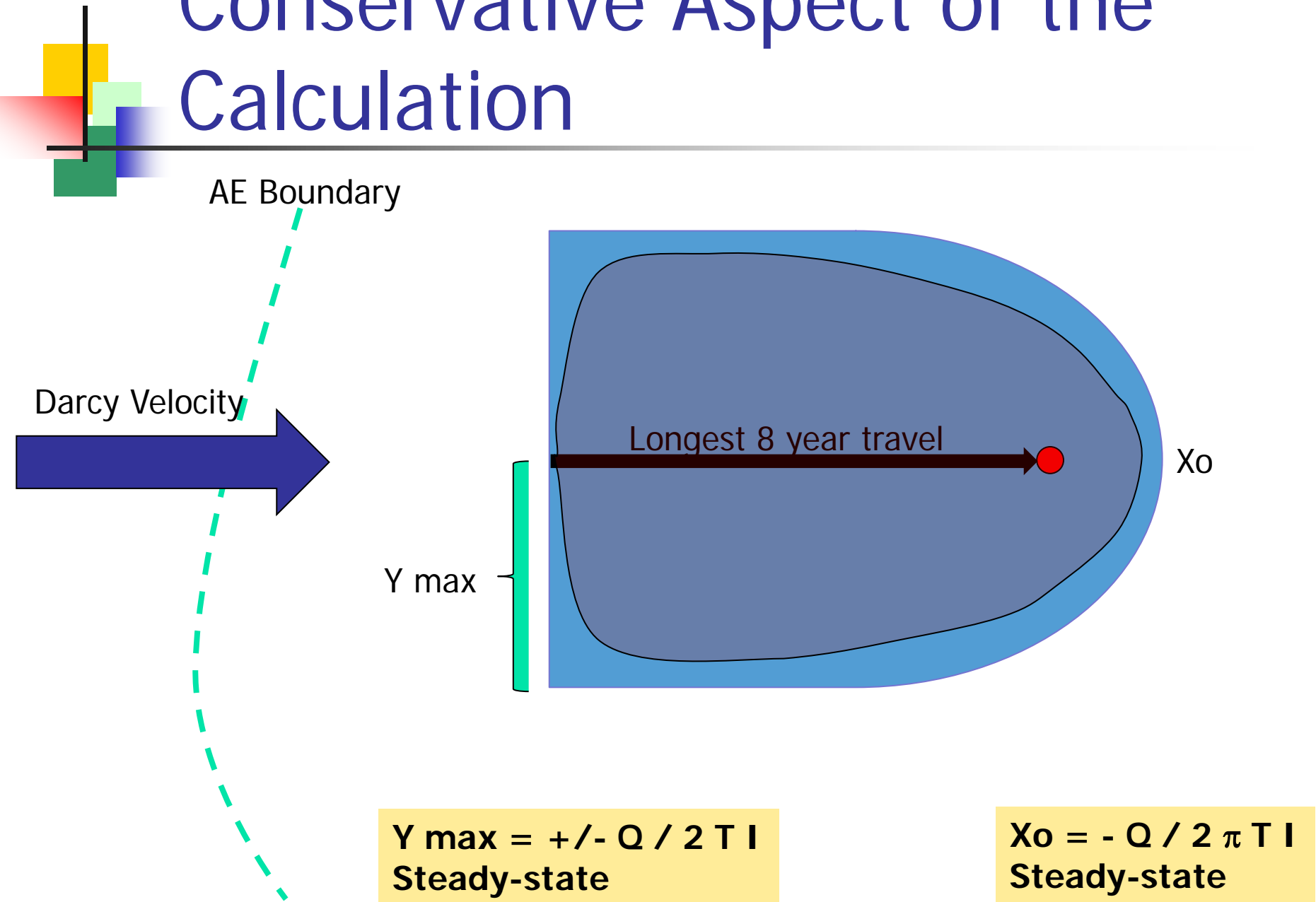
Rural/Domestic Use

- $2.6 \text{ people} \times 119 \text{ gpd/person} = 309.4 \text{ gpd}$
- $309.4 \text{ gpd} = 0.215 \text{ gpm} = 41.4 \text{ ft}^3/\text{day}$

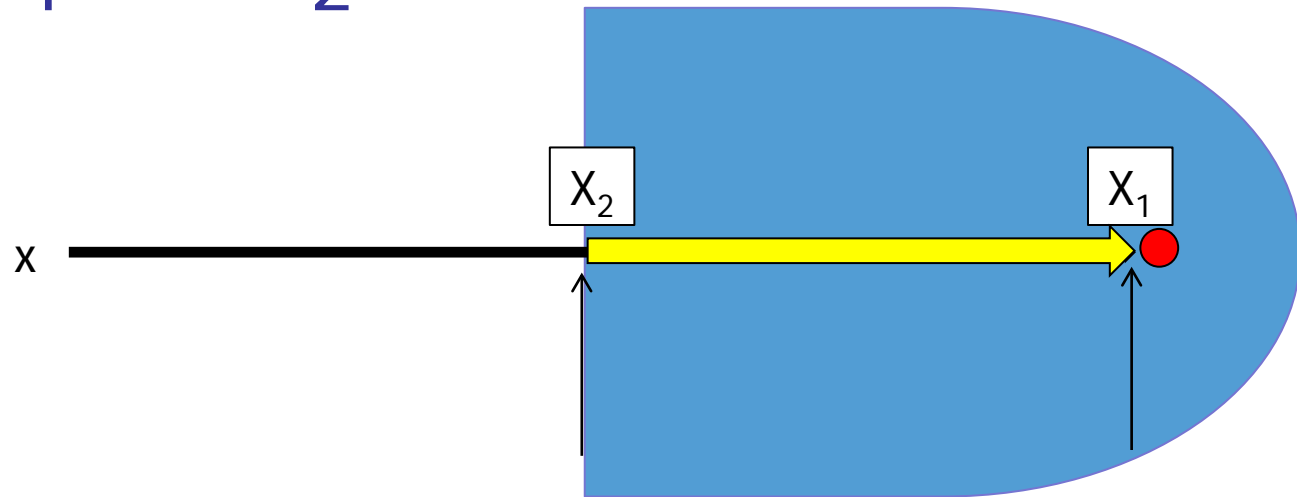
Calculation of the 8 year Capture Zone



Conservative Aspect of the Calculation



Travel Time Calculation from X_1 to X_2



Travel Time from x_2 to x_1 =

$$\{vx_2 - Q/2\pi b\phi [\ln (vx_2 + Q/2\pi b\phi)]\} / v^2 -$$

$$\{vx_1 - Q/2\pi b\phi [\ln (vx_1 + Q/2\pi b\phi)]\} / v^2$$



Product to EPA

- Review all wells in the AOR and provide verification of where the wells are completed where we have data
- Develop reasonable estimates of:
 - Aquifer properties
 - Hydraulic gradients
 - Rural/domestic pumping rate



Product to EPA

- Provide plots of the 8 year capture zones for each rural/domestic well in the AOR
 - If a well is known to be completed in a particular stratum, calculations for that well will be limited to that stratum
 - If completion of a well is unknown, the calculations will be performed assuming all four potential strata
- Technical memorandum documenting results



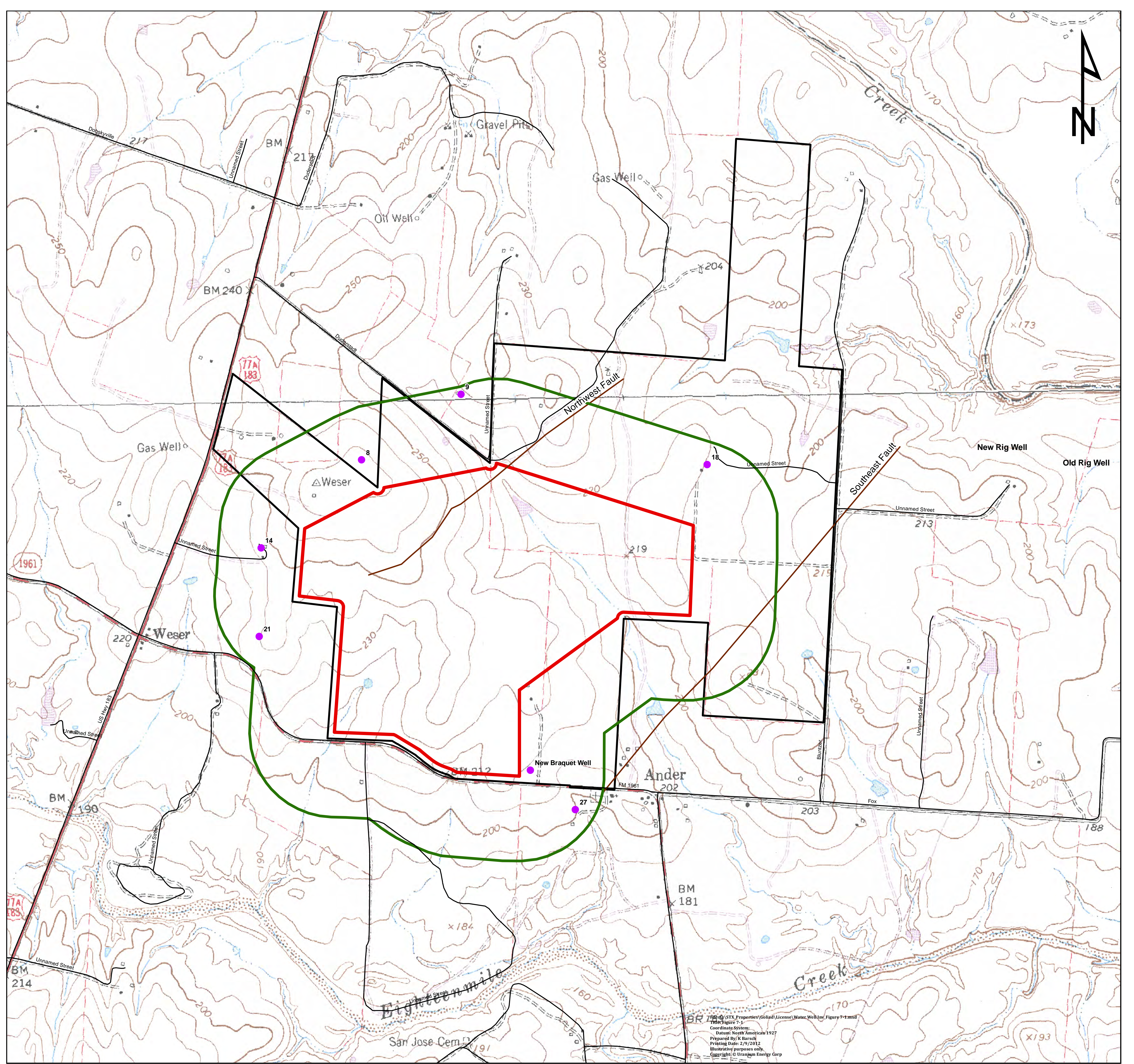
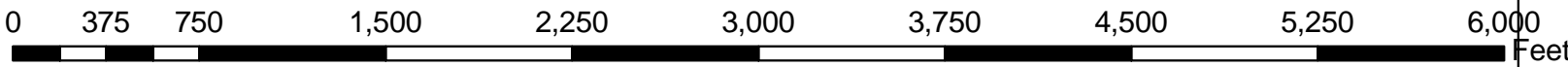


Figure 7-1 Water Well Inventory

1 inch = 750 feet



Legend		Water Well		Aquifer Exemption .25 MI Buffer
		Roads		Aquifer Exemption Boundary
		Fault		License Boundary

Figure 7-1	
Drawn By: M. Bell 10/28/2008	
Checked by: C.H.	
Revisions K Barsch 2/7/2012	

File: G:\STX Properties\Gold\License\Water Well Inv\Figure 7-1.mxd
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Coordinate System:
Datum: North American 1927
Prepared By: K Barsch
Printing Date: 2/9/2012
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